CONTEXT COMPLEXITY vs OPERATOR COMPLEXITY
1. CONTEXT SELECTS THE OPERATOR
context c(x)
select
A_c
apply to x
2. LINEAR MAPPINGS LIVE IN A SMALL SPACE
operator space
$\mathcal{L}(V) = \mathbb{R}^{m \times n}$
(mn parameters)
• Restricted. Averaging.
• Cannot represent arbitrary functions.
3. CONCATENATION STAYS IN THE OPERATOR ALGEBRA
$A_{c_1} \to A_{c_2} \to \cdots \to A_{c_L}$
For any context sequence:
$F(x) = A_{c_L} \cdots A_{c_2} A_{c_1} x$
$= Mx$ (linear)
All paths remain in the algebra of linear operators!
Context is the map...
Local linear maps are the ride along!
Many possible contexts! (2^b)
TWO KINDS OF COMPLEXITY
• Context complexity: number of routes (can be exponential)
• Operator complexity: each local map (low: mn parameters)
Training? Backpropagation and other methods can optimize both the selectors and the linear mappings.
THE BIG IDEA
Explosion in the SELECTION of operators, not in the COMPLEXITY of the operators.
Smart routes. Simple operators.
Cherry power!
Notes
CHERRY JAM Special Guest!
CHERRY JAM
Life is better with cherries!
Discuss. Derive. Dessert!

Context Complexity versus Operator Complexity